NATIONAL WEATHER SERVICE WESTERN REGION SUPPLEMENT 12-2003
APPLICABLE TO NWSI 10-310
APRIL 11, 2008

Operations and Services
Marine and Coastal Weather Services, NWSPD 10-3
Coastal Marine Forecast Services, NWSI 10-310

MARINE WEATHER SERVICES

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OPR: W/WR1x4 (J. Lorens) **Certified by:** W/WR1 C. Schmidt
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWS Western Region Supplement 12-2003 dated November 11, 2005.

The following changes were made in this issuance:

1. Added Appendix for WFO wave steepness criteria (for Small Craft Advisory for Hazardous Seas and Hazardous Seas Warning).
2. Added allowance to use "MODERATE" Category for rip current risk.

Signed 03/20/08
Robert Tibi Date
Acting Director, Western Region

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1. Introduction. This regional supplement provides additional guidance and instructions for marine weather products and services including Coastal Waters Forecasts and Surf Zone Forecasts. Written instructions cannot address every situation. Operational personnel must exercise initiative and professional judgment to minimize risk to public safety and property in instances when written instructions do not provide appropriate guidance. Personnel must balance safety and needs of customers against frequency of warnings and possible constraint of travel and commerce. Protection of life and property will take precedence in these decision-making processes.

2. Coastal Waters Forecasts (CWF).

2.1 Preparation and Issuance. Western Region (WR) Weather Forecast Offices (WFOs) will prepare and issue Coastal Waters Forecast (CWF) products for their marine areas of responsibility, in accordance with NWSI 10-310 (Coastal Marine Forecast Services). NWSI 10-506 (Digital Data Products/Services Specification), and this Supplement. Scheduled issuance times for CWFs are: 0300/0900/1500/2100 (Local Time). CWFs will be issued no earlier than

one hour prior to, but no later than scheduled issuance times. Unscheduled (updated or corrected) CWFs will be issued as necessary. Gridded marine elements will be updated as needed to ensure currency.

2.2 CWF Format. Refer to NWSI 10-310 for general CWF format.

2.2.1 Reference to National Marine Sanctuaries. WFOs Los Angeles, San Francisco Bay Area, and Seattle will reference National Marine Sanctuaries in their areas of responsibility in the SYNOPSIS description line or in the areal description line of the Mass News Disseminator (MND).

2.3 CWF Content.

2.3.1 Synopsis. WR WFOs will include a brief synopsis discussing the dominant weather features affecting the WFOs coastal waters area of responsibility, including general trends (movement, intensification, weakening, etc.). Primary emphasis will be placed on the first 36-48 hours of the forecast, emphasizing weather features expected to result in a significant degradation or improvement of forecast conditions, particularly when marine warning/advisory thresholds are expected to be crossed.

2.3.2 Forecast Content. Refer to NWSI 10-310 for basic guidance on CWF content.

a. Waves. Except as noted, wave information will be separated into its separate components.

1. Wind wave height (feet).

2. Swell. Swell information will be included for coastal waters marine zones (0 to 60 nautical miles from the coast). Swell will not be included in inland waters marine zones (e.g. Puget Sound).

a. Swell direction and height (feet).

b. Swell period (seconds). Include swell period in the first three forecast periods only.

c. Mixed Swell. A secondary swell should also be included if it can be clearly identified. In such cases, specify the predominant swell first, then the secondary swell. Include a direction, height, and period for each swell. As general guidance, include a secondary swell if it differs from the primary swell by 90 degrees or more, the height of the secondary swell is at least half the height of the primary swell, or if it poses a special hazard (e.g. shoaling in shallower depths due to longer period).

3. Combined Seas (Combination of swell height and wind wave height, typically synonymous with **significant wave height**). The term "combined seas" will be substituted for the combination of ***swell*** and ***wind wave*** when the two cannot be clearly distinguished.

2.4 River/Bay Bar Forecasts. Certain areas along the California, Oregon, and Washington coasts, especially near (or at) the entrance to rivers and bays, are identified as "bars". These areas may have significantly different wave conditions than surrounding coastal waters. For these areas, specific wave forecasts and related information (e.g. tidal information), may be included in the CWF. Some river/bay bars have unique marine zones assigned to them, while others may be part of an existing coastal waters marine zone.

The following is an example of a bar forecast for a unique marine zone (a separate segment within the CWF):

PZZ210-202230-
/O.ROU.KPQR.MA.F.0000.000000T0000Z-000000T0000Z/
COLUMBIA RIVER BAR-
820 AM PDT MON AUG 20 2007

.IN THE MAIN CHANNEL...COMBINED SEAS 4 TO 5 FT TODAY AND TONIGHT.
HOWEVER...SEAS TEMPORARILY BUILDING TO 6 FT DURING THE EBB
CURRENTS AROUND 10 AM THIS MORNING AND 1045 PM TONIGHT.

The following is an example of a bar forecast for an area which is part of an existing coastal waters marine zone (appended to segment):

PZZ550-570-202215-
/O.ROU.KMTR.MA.F.0000.000000T0000Z-000000T0000Z/
POINT ARENA TO PIGEON POINT TO 20 NM-
POINT ARENA TO PIGEON POINT 20 TO 60 NM OFFSHORE-
826 PM PDT MON AUG 20 2007

.TODAY...NW WINDS 5 TO 10 KT. WIND WAVES 1 TO 2 FT.
NW SWELL 2 TO 4 FT AT 8 SECONDS. PATCHY FOG IN THE MORNING.
.TONIGHT...NW WINDS 5 TO 15 KT. WIND WAVES 1 TO 3 FT.
NW SWELL 2 TO 4 FT AT 9 SECONDS. PATCHY FOG AFTER MIDNIGHT.
.TUE...NW WINDS 10 TO 15 KT...INCREASING TO 15 TO 25 FT IN THE
AFTERNOON. WIND WAVES 2 TO 5 FT. W. SWELL 3 TO 5 FT AT 9 SECONDS.
PATCHY FOG IN THE MORNING.
.TUE NIGHT...NW WINDS 15 TO 25 KT. WIND WAVES 3 T0 5 FT.
NW SWELL 4 TO 6 FT. PATCHY FOG.
.WED...NW WINDS 20 TO 30 KT. WIND WAVES 4 TO 5 FT.
NW SWELL 5 TO 8 FT. AND S 2 FT. PATCHY FOG.
.THU...NW WINDS 20 TO 30 KT. WIND WAVES 4 TO 7 FT.
NW SWELL 6 TO 9 FT. PATCHY FOG.

.FRI...NW WINDS 15 TO 25 KT. WIND WAVES 3 TO 6 FT.
NW SWELL 6 TO 8 FT. PATCHY FOG.

.....SAN FRANCISCO BAR/FOURFATHOM BANK FORECAST.....

.IN THE DEEP WATER CHANNEL...COMBINED SEAS 3 TO 4 FT AT 8 SECONDS.

.ACROSS THE BAR...COMBINED SEAS 4 TO 5 FEET AT 8 SECONDS. SEAS OCCASIONALLY TO 6 FEET DURING MAXIMUM EBB CURRENT OF 0.5 KNOT AT 10:16 AM THIS MORNING AND 1.2 KNOTS AT 10:36 PM THIS EVENING.

2.5 Headlines. Refer to NWSI 10-310 for general guidance on marine headlines.

2.5.1 Hazardous Sea Warnings: "Hazardous Sea Warnings" may be issued by WR coastal WFOs when existing or expected wave conditions pose a heightened threat to life and property. Similar to "Small Craft Advisories for Hazardous Seas" (SCAHS - - see below), "Hazardous Seas Warnings" are based on a combination of wave height and/or steepness, but criteria are more severe than for SCAHS. Wave steepness is defined as "the ratio of wave height to wave length" (ref: NWSI 10-301). See Appendix A for WR local WFO wave steepness criteria.

2.5.2 Small Craft Advisories. Refer to NWSI 10-310 for guidance on Small Craft Advisories. Specific categories and procedures for Small Craft Advisories in WR are as follows.

a. "Small Craft Advisory" and "Small Craft Advisory for Wind". WR WFOs have the option of using "Small Craft Advisory" or "Small Craft Advisory for Wind", when only the wind speed threshold is expected to be met or exceeded. The wind speed threshold for WR is 21 to 33 knots, inclusive. Note: Gusts should occur for at least two hours in any given forecast period to be considered "frequent" (Ref: NWSI 10-301). WFOs may use up to 25 knots as the lower threshold of this range, based on customer requirements.

   A "Small Craft Advisory" may be issued in lieu of separate advisories for winds and hazardous seas (2.5.2.b), when the valid time is the same. The headline in this situation may be adjusted to read "Small Craft Advisory for Winds and Hazardous Seas".

b. Small Craft Advisory for Hazardous Seas (SCAHS). "Small Craft Advisory for Hazardous Seas" is based on wave height and/or steepness. See Appendix A for WR local WFO wave steepness criteria.

c. Small Craft Advisory for Rough Bar. "Small Craft Advisory for Rough Bar" is used only by coastal WFOs issuing bar forecasts (see 2.4, "River/Bay Bar Forecasts"). Criteria for this type of Small Craft Advisory are locally defined, based on customer requirements. If used, WFOs will notify NWS Western Region HQ (MSD) of their criteria (also if criteria changes).

2.5.3 Use of "Expected" Conditions Headline. When necessary to convey information regarding conditions expected to meet or exceed marine warning criteria (Gale or stronger winds, or seas meeting/exceeding Hazardous Seas Warning criteria), and the expected conditions are forecast to begin beyond normal marine warning issuance periods, forecasters may insert a headline for "Expected" conditions. For example:

"...GALE FORCE WINDS EXPECTED THURSDAY..."

Headlines for "Expected" conditions should normally be limited to those events beginning through the "Day 3 " period. For situations involving exceptionally strong winds or dangerous seas, an "Expected" condition headline may be used for the "Day 4 " period. In all cases, use of this headline should be limited to situations in which forecaster confidence is high.

3. Surf Zone Forecasts (SRF). See NWSI 10-310 for general information and guidance on the SRF. WFOs which do not routinely provide rip current outlook information may include this information in High Surf Advisories/Warnings, Coastal Flood Advisories / Warnings / Watches (CFW) (Ref: NWSI 10-320 and WR Supplement), and the Hazardous Weather Outlook (Ref: NWSI 10-517 and WR Supplement). For WFOs routinely issuing SRFs, High Surf and Coastal Flood Advisories / Warnings / Watches should be headlined in the SRF. Additionally, WFOs routinely issuing SRFs will include a headline in the SRF whenever the risk of rip currents is "HIGH".

3.1 Issuance. In WR, the SRF will be issued daily at **0200 and 1400 (Pacific Local Time)**. The SRF is intended to be issued on a scheduled basis only, but may be updated at WFO discretion if conditions change significantly. The SRF may be issued up to 30 minutes prior to, but not later than the scheduled issuance times. During unusually heavy workload situations, the SRF may be issued up to 1 hour prior to the scheduled issuance time.

3.2 Format. WR WFOs will use the format as indicated in Figure 1. See Appendix A for an example SRF.

3.3 Content. SRFs issued by WR offices will contain the following elements:

a. Rip Current Risk. Use "LOW" or "HIGH" (reference: NWSI 10-310). Forecasters may also use "MODERATE" if they are sufficiently confident.

b. Surf Height (Approximate height of breaking waves). For swell information, SRFs may reference the local WFOs Coastal Waters Forecast (CWF).

c. Surf (Water) Temperature. Specify appropriate range (degrees F).

4. Forecast Collaboration. WFOs routinely collaborate with adjacent offices and with the Ocean Prediction Center (OPC), as necessary during the forecast process to facilitate or improve consistency of marine forecasts, watches, warnings, and advisories. Forecasters will use available means for collaboration (chat software, telephone, intersite coordination tools (IFPS/ISC), etc.).

Figure 1. Surf Zone Forecast (SRF) Format

```
FPZUS KXXX ddhhmm
SRFXXX

SURF ZONE FORECAST
NATIONAL WEATHER SERVICE CITY STATE
time am/pm LT day mon dd yyyy

.FOR THE BEACHES OF (specify area)...for (day)...

* THE FOLLOWING INFORMATION APPLIES WHEN FORECAST RIP CURRENT
POTENTIAL IS "LOW":  DUE TO HIGHLY VARIED COASTAL TOPOGRAPHY
DANGEROUS RIP CURRENTS ARE ALWAYS A POSSIBILITY ALONG THE SOUTHERN
CALIFORNIA COAST...AND SWIMMERS ARE URGED TO USE CAUTION AT ALL
TIMES.

CAZXXX-XXX>XXX-ddhhmm-
Counties
time am/pm day mon dd yyyy

...(HEADLINES as needed)...

.TODAY...
SURF HEIGHT...................(specify height in ft)
RIP CURRENT POTENTIAL.........(LOW or HIGH)*
WATER TEMPERATURE.............(specify in degrees F)

REMARKS.......................(as needed)
OUTLOOK FOR (following day)...(outlook for surf height)

$$
CAZXXX-XXX>XXX-ddhhmm-
Counties
time am/pm day mon dd yyyy

...(HEADLINES as needed)...

.TODAY...
SURF HEIGHT...................(specify)
RIP CURRENT POTENTIAL.........(LOW or HIGH)*
WATER TEMPERATURE.............(specify in degrees F)

REMARKS.......................(as needed)
OUTLOOK FOR (following day)...(outlook for surf height)

$$
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APPENDIX A - Wave Steepness Criteria (Note: The tables below are for information. Individual WFOs may utilize more detailed local tables with additional information. "Swell Height" and "Swell Period" may be used for "Wave Height: and "Wave Period" as needed).

WFO Seattle, WA

Wave Height (feet)	Wave Period (Seconds)						
	? 7	8	9	10	11	12	? 13
? 5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
? 15							
16							
17							
18							

Small Craft Advisory for Hazardous Seas

None

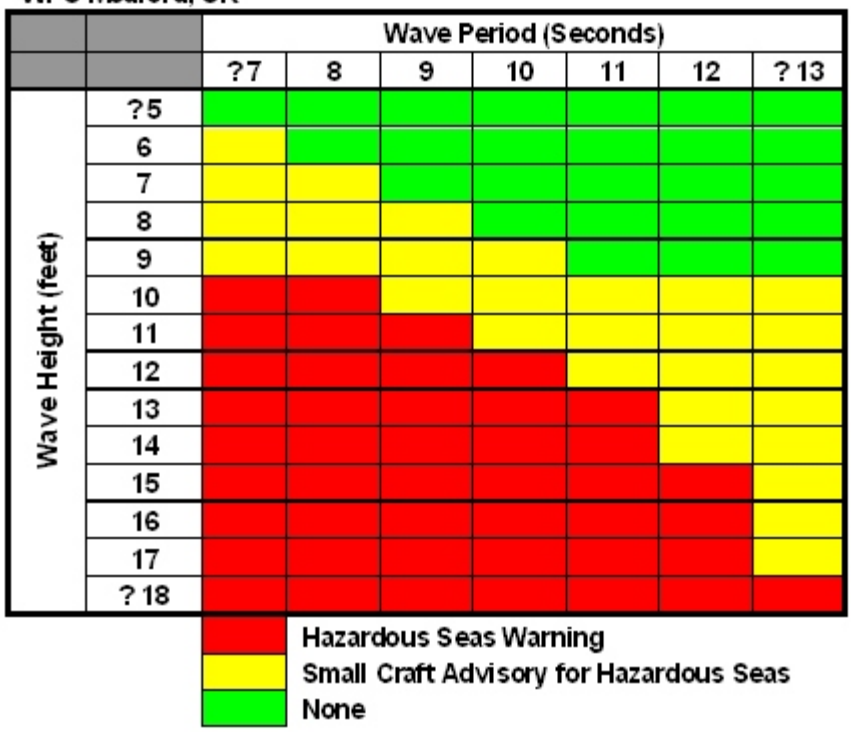
WFO Portland, OR

Height (feet)	Wave Period (Seconds)						
	? 7	8	9	10	11	12	? 13
? 5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
? 18							

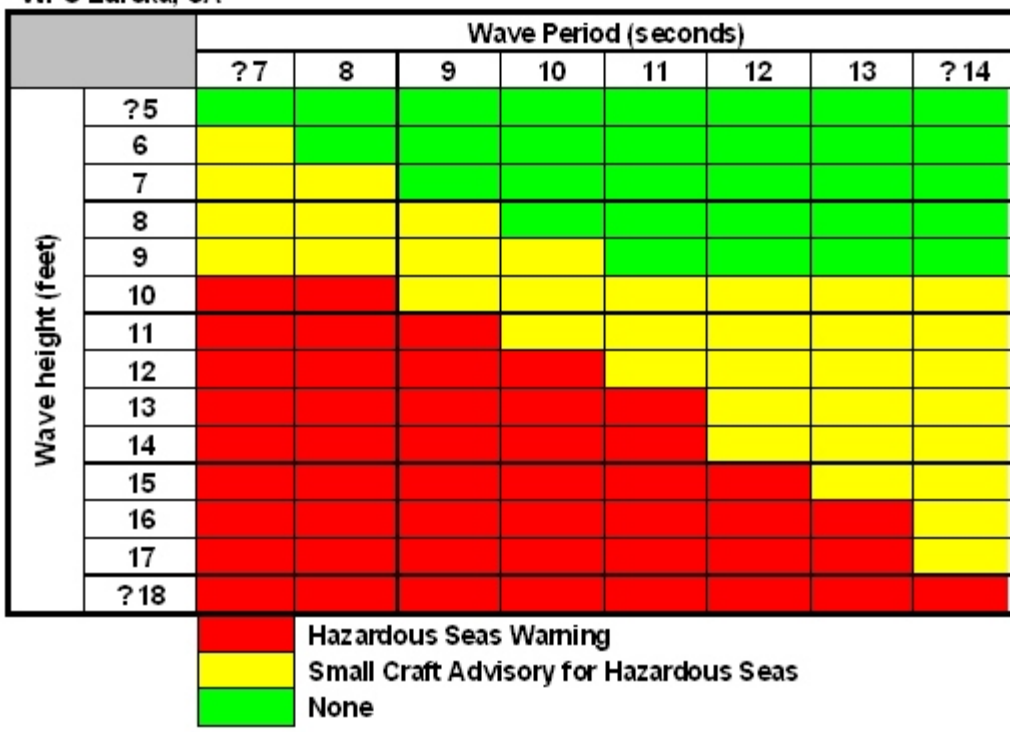
Small Craft Advisory for Hazardous Seas

None

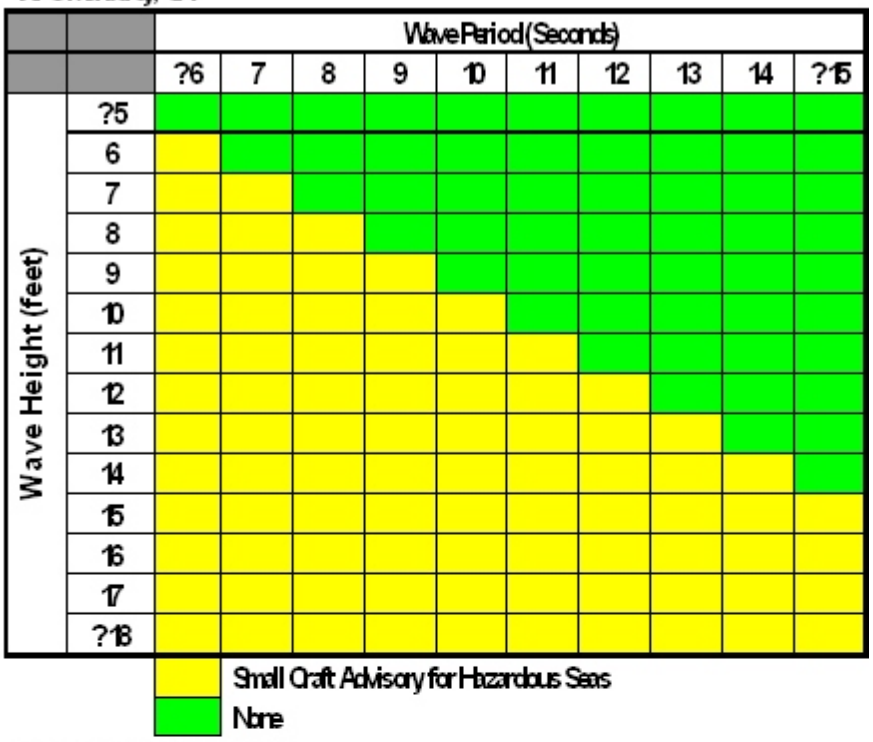
WFO Medford, OR



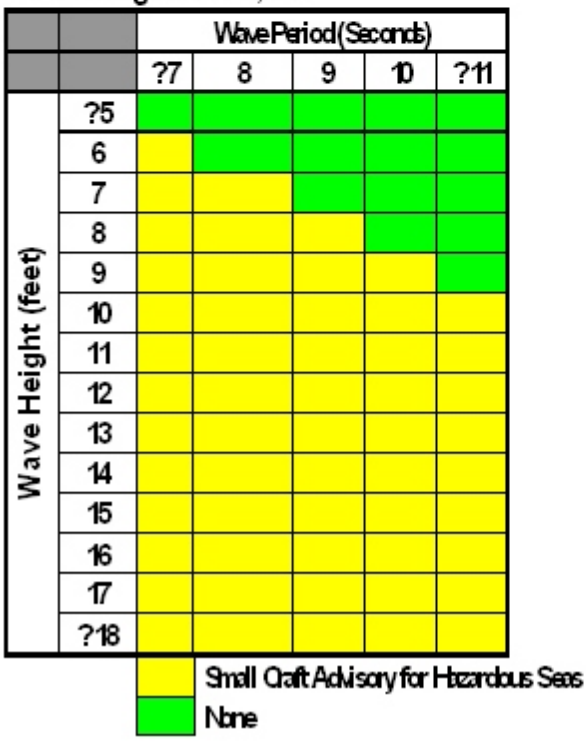
WFO Eureka, CA



WFOMonterey, CA



WFOLos Angeles/Oxnard, CA



WFO San Diego, CA

		Wave Period (Seconds)					
		? 6	7	8	9	10	? 11
Wave Height (feet)	? 5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	? 18						

Small Craft Advisory for Hazardous Seas

None

APPENDIX B - Example Surf Zone Forecast

FZUS56 KLOX 182116
SRFLOX

SURF ZONE FORECAST
NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD CA
200 PM PDT TUE OCT 18 2005

.FOR THE BEACHES OF SOUTHERN CALIFORNIA...VALID WED OCT 19…

* THE FOLLOWING INFORMATION APPLIES WHEN FORECAST RIP CURRENT POTENTIAL IS “LOW”: DUE TO HIGHLY VARIED COASTAL TOPOGRAPHY, DANGEROUS RIP CURRENTS ARE ALWAYS A POSSIBILITY ALONG THE SOUTHERN CALIFORNIA COASTS, AND SWIMMERS ARE URGED TO USE CAUTION AT ALL TIMES.

CAZ041-190900-
LOS ANGELES COUNTY COAST-
200 PM PDT TUE OCT 18 2005

…HIGH POTENTIAL FOR RIP CURRENTS TODAY…

WEDNESDAY...
SURF HEIGHT.....5-7 FEET
RIP CURRENT POTENTIAL……..HIGH*
WATER TEMPERATURE.....59-68 DEGREES

REMARKS...NONE

OUTLOOK FOR THURSDAY...LITTLE CHANGE

$$

CAZ040-190900-
VENTURA COUNTY COAST-
200 PM PDT TUE OCT 18 2005

...HIGH POTENTIAL FOR RIP CURRENTS TODAY...

WEDNESDAY...
SURF HEIGHT.....4-6 FEET
RIP CURRENT POTENTIAL……..HIGH*
WATER TEMPERATURE.....57-62 DEGREES

REMARKS...NONE

OUTLOOK FOR THURSDAY...LITTLE CHANGE

$$

CAZ039-190900-
SANTA BARBARA COUNTY SOUTH COAST-
200 PM PDT TUE OCT 18 2005

.WEDNESDAY...
SURF HEIGHT.....2-4 FEET
RIP CURRENT POTENTIAL……..HIGH*
WATER TEMPERATURE.....60-63 DEGREES

REMARKS...NONE

OUTLOOK FOR THURSDAY...LITTLE CHANGE

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